

Serial No.: 10/684,417
Docket No.: 102-1001
Amendment dated August 13, 2008
Reply to the Office Action of May 13, 2008

Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended): A paper-discharging apparatus used with an image-forming device, the paper-discharging apparatus provided with paper-discharging rollers and idle rollers disposed in a paper-discharging port side of the image forming device, in which a sheet of paper is discharged through the paper-discharging rollers and the idle rollers, the paper-discharging apparatus comprising:

a supporting plate coupled at opposite ends thereof to a body of the image-forming device and installed at the paper-discharging port side of the image-forming device;

a supporting bracket coupled at a middle portion thereof to the supporting plate to rotatably support the idle rollers facing the paper-discharging rollers; and

a spacing adjustment unit disposed between the idle rollers to constantly maintain a contact pressure between the paper-discharging rollers and the idle rollers, wherein the spacing adjustment unit comprises:

an elastic member provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively; and

a guide unit to suppress transverse and bending movements of the elastic member, wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled; and

a hole formed on the other one of the support plate and the support bracket, and the support plate and the support bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

Serial No.: 10/684,417
Docket No.: 102-1001
Amendment dated August 13, 2008
Reply to the Office Action of May 13, 2008

2. (Canceled)

3. (Currently Amended): The paper-discharging apparatus according to claim 12, wherein the supporting plate and the supporting bracket are connected to be movable with respect to each other.

4. (Canceled)

5. (Canceled)

6. (Currently Amended): The paper-discharging apparatus according to claim 15, wherein the elastic member comprises:

a coil spring installed to wrap around a circumferential surface of the clamping boss.

7. (Canceled)

8. (Currently Amended): The paper-discharging apparatus according to claim 17, wherein the elastic member is formed longer than a projecting length of the clamping boss by a predetermined length, so that the elastic member is compressed as a spacing distance between the supporting plate and the supporting bracket is reduced when the supporting plate and the supporting bracket are assembled.

9. (Original): The paper-discharging apparatus according to claim 8, wherein the spacing adjustment unit further comprises:

another elastic member provided between the supporting plate and the supporting bracket; and

another clamping boss provided to correspond to the another elastic member.

Serial No.: 10/684,417
Docket No.: 102-1001
Amendment dated August 13, 2008
Reply to the Office Action of May 13, 2008

10. (Currently Amended): A paper-discharging apparatus to discharge a sheet of paper between a paper-discharging roller and an idle roller which are disposed in a paper-discharging port side of an image-forming device, comprising:

a supporting plate formed on the paper-discharging port side of the image-forming apparatus having opposite ends thereof fixedly coupled to a body of the image-forming apparatus;

a supporting bracket having a middle portion formed between opposite ends thereof, on which the idle roller is rotatably mounted to contact the paper-discharging roller; and

a spacing adjustment unit to flexibly couple the supporting plate and the middle portion of the supporting bracket to adjust a distance between the supporting plate and the middle portion of the supporting bracket according to an external force exerted on one of the supporting plate and the supporting bracket, wherein the spacing adjustment unit comprises:

an elastic member provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively, wherein the elastic member is disposed between the supporting plate and the middle portion of the supporting bracket to elastically adjust the distance between the supporting plate and the middle portion of the supporting bracket; and

a guide unit to suppress transverse and bending movements of the elastic member, wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled; and

a hole formed on the other one of the support plate and the support bracket, and the supporting plate and the supporting bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

11. (Previously Presented): The paper-discharging apparatus according to claim 10, wherein the spacing adjustment unit controls the supporting bracket to maintain a contact

Serial No.: 10/684,417

Docket No.: 102-1001

Amendment dated August 13, 2008

Reply to the Office Action of May 13, 2008

pressure generated between the paper-discharging roller and the idle roller constant while adjusting the distance between the supporting plate and the middle portion of the supporting bracket.

12. (Original): The paper-discharging apparatus according to claim 10, wherein the middle portion of the supporting bracket is spaced-apart from the supporting plate by the distance in a direction perpendicular to the paper disposed between the paper-discharging roller and the idle roller.

13. (Previously Presented): The paper-discharging apparatus according to claim 10, wherein when the external force is exerted on one of the supporting plate and the supporting bracket, a portion of the supporting plate moves toward the middle portion of the supporting bracket while a distance between the middle portion of the supporting bracket and the paper-discharging roller is maintained constant.

14. (Canceled)

15. (Currently Amended): A paper-discharging apparatus to discharge a sheet of paper between a paper-discharging roller and an idle roller which are disposed in a paper-discharging port side of an image-forming device, comprising:

a supporting plate formed on the paper-discharging port side of the image-forming apparatus having opposite ends thereof fixedly coupled to a body of the image-forming apparatus;

a supporting bracket having a middle portion formed between opposite ends thereof, on which the idle roller is rotatably mounted to contact the paper-discharging roller; and

a spacing adjustment unit to flexibly couple the supporting plate and the middle portion of the supporting bracket to adjust a distance between the supporting plate and the middle portion of the supporting bracket according to an external force exerted on one of the supporting plate and the supporting bracket. The paper-discharging apparatus according to claim 10, wherein the spacing adjustment unit comprises:

Serial No.: 10/684,417

Docket No.: 102-1001

Amendment dated August 13, 2008

Reply to the Office Action of May 13, 2008

a plurality of elastic members disposed between the supporting plate and the middle portion of the supporting bracket to elastically adjust the distance between the supporting plate and the middle portion of the supporting bracket, wherein at least one of the elastic members is provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively; and

a guide unit to suppress transverse and bending movements of the elastic member,
wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled; and

a hole formed on the other one of the support plate and the support bracket, and the support plate and the support bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

16. (Original): The paper-discharging apparatus according to claim 15, wherein the elastic members are disposed between the opposite ends of the supporting bracket at a predetermined interval.

17. (Previously Presented): The paper-discharging apparatus according to claim 16, wherein the elastic members are compressed by different amounts to have different amounts of elastic potential.

18. (Currently Amended): The paper-discharging apparatus according to claim 10-14, wherein the supporting plate elastically moves toward the supporting bracket according to an elasticity of the elastic member while a distance between the paper-discharging roller and the idle roller is maintained constant.

19. (Currently Amended): A paper-discharging apparatus to discharge a sheet of paper between a plurality of paper-discharging rollers and a plurality of idle rollers, which are

Serial No.: 10/684,417

Docket No.: 102-1001

Amendment dated August 13, 2008

Reply to the Office Action of May 13, 2008

rotated by corresponding ones of the paper-discharging rollers in an image-forming device, the paper-discharging apparatus comprising:

a supporting plate formed on a paper-discharging port side of the image-forming device having opposite ends thereof mounted on a body of the image forming device;

a supporting bracket having a middle portion formed between opposite ends thereof, on which the idle rollers are rotatably mounted to contact corresponding ones of the paper-discharging rollers; and

a spacing adjustment unit disposed between the middle portion of the supporting bracket and the supporting plate to flexibly couple the supporting plate with the middle portion of the supporting bracket to maintain a contact pressure generated between corresponding ones of the paper-discharging rollers and the idle rollers regardless of an external force exerted on one of the supporting plate and the supporting bracket, wherein the spacing adjustment unit comprises:

an elastic member provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively; and

a guide unit to suppress transverse and bending movements of the elastic member, wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled; and

a hole formed on the other one of the support plate and the support bracket, and the supporting plate and the supporting bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

20. (Original): The paper-discharging apparatus according to claim 19, wherein a distance between the supporting plate and the middle portion of the supporting bracket varies according to the spacing adjustment unit while the contact pressure is maintained constant.

Serial No.: 10/684,417

Docket No.: 102-1001

Amendment dated August 13, 2008

Reply to the Office Action of May 13, 2008

21. (Original): The paper-discharging apparatus according to claim 19, wherein the middle portion of the supporting bracket is spaced-apart from the supporting plate by a distance which varies according to deformation of the supporting plate.

22. (Original): The paper-discharging apparatus according to claim 19, wherein a distance between the middle portion of the supporting bracket and the paper-discharging rollers is maintained constant.

23. (Previously Presented): The paper-discharging apparatus according to claim 19, wherein the middle portion of the supporting bracket is not deformed in a direction perpendicular to an axis passing through a center of each of the paper-discharging rollers while the supporting plate is elastically deformed.

24. (Currently Amended): A paper-discharging apparatus to discharge paper from an image forming device having paper-discharging rollers, comprising:

a supporting plate positioned at a paper-discharging port side of the image forming device and fixedly mounted at opposite ends thereof to a body of the image forming device; and

a supporting bracket including idle rollers facing the paper-discharging rollers, the supporting bracket flexibly mounted at a middle portion thereof to the supporting plate to maintain a constant contact pressure between the idle rollers and respective paper-discharging rollers; and

a spacing adjustment unit disposed between the idle rollers to constantly maintain a contact pressure between the paper-discharging rollers and the idle rollers, wherein the spacing adjustment unit comprises:

an elastic member provided between the supporting plate and the supporting bracket so that opposite ends thereof abut with the supporting bracket and the supporting plate, respectively; and

a guide unit to suppress transverse and bending movements of the elastic member, wherein the guide unit comprises:

at least one clamping boss protruding from one of the supporting plate and the supporting bracket such that the clamping boss is located between the

Serial No.: 10/684,417

Docket No.: 102-1001

Amendment dated August 13, 2008

Reply to the Office Action of May 13, 2008

supporting plate and the supporting bracket when the supporting plate and the supporting bracket are assembled; and

a hole formed on the other one of the support plate and the support bracket, and the supporting plate and the supporting bracket are connected with each other by a clamping screw inserted into the hole to be engaged with the clamping boss.

25. (Original): The paper-discharging apparatus according to claim 24, wherein the supporting plate has a supporting plate axis disposed substantially parallel to at least one of a first center axis of the idle rollers of the supporting bracket and a second center axis of the discharging rollers, and the supporting plate axis of the supporting plate becomes disposed not to be parallel to the at least one of the first center axis and the second center axis according to a force exerted on one of the supporting plate and the supporting bracket while the first center axis and the second center axis are maintained substantially parallel to each other.

26. (Canceled)

27. (Canceled)